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Lipid disorders in patients with alcoholic liver cirrhosis

Zaburzenia lipidowe u pacjentów z alkoholową marskością wątroby

INTRODUCTION

Alcoholic liver disease (ALD) continues to be a major cause of cirrhosis and death around the world. In the United States, there are at least 14 million problem drinkers and alcoholics, and alcohol abuse is one of the most important causes of chronic liver disease [7]. In chronic liver disease there are lipid alterations due to a decrease in lipoprotein synthesis and degradation of lipoprotein complex by liver and regurgitation of biliary content into the serum. The Child-Pugh (Ch-P) score is a classification of the severity of cirrhosis. In this study, we investigated the lipid parameters in the patients with alcoholic liver cirrhosis.

The aim of the research was to analyze lipid disorders in patients with alcoholic liver cirrhosis depending on the severity of hepatic cell damage according to the Child-Pugh classification.

MATERIAL AND METHODS

One hundred and fifty-two patients with alcoholic liver cirrhosis, who were hospitalized in the internal medicine department, were included to this study. Of the patients, 53 (35%) were female and 99 (65%) were male. Diagnosis of liver cirrhosis was based on physical examination, laboratory investigations and ultrasonography of abdominal cavity. For the determination of the prognosis, Child-Pugh classification was used. After 12 h of fasting, serum triglyceride, total cholesterol, LDL-cholesterol, HDL-cholesterol were studied. For the statistical study, mean standard deviation, Kruskall-Wallis and Shapiro-Wilk tests were used.

RESULTS

The mean age of the study group was 61.4 (±17.1) years in class A, 57.5 (± 11.5) years in class B and 54.9 (±12.2) years in class C. According to the Child-Pugh classification of cirrhotic patients in this study, 22 (14%) were in group A, 56 (37%) were in group B and 74 (48%) were in group C. The

mean values of lipid parameters of cirrhotic in patients according to the Child-Pugh classification are shown in Table 1.

Table 1. The mean values of lipid parameters of cirrhotic in patients according to the Child-Pugh classification (A, B, C – Child-Pugh classification, N – number patients, SD – standard deviation)

Child-Pugh score	A			B			C			p
	N	mean	SD	N	mean	SD	N	mean	SD	
TG (mg/dl)	22	115	48.56	56	136.79	61.53	74	124.43	49	p>0.05
LDL-chol (mg/dl)	22	112	35.98	56	83.75	43.42	74	84.49	46	p<0.05
HDL- chol (mg/dl)	22	45	20.58	56	27.36	15.64	74	32.56	15	p<0.001
T cholesterol (mg/dl)	22	176	44.37	56	162.57	76.39	74	157.16	57	p>0.05
Age	22	61	17	56	57.50	11.50	74	54	12	p>0.05

The parameters such as total cholesterol and triglyceride were not statistically different in groups according to the Child-Pugh classification. All parameter levels were the lowest in Child-Pugh C group. Statistically, mean LDL-cholesterol value of Child-Pugh A was significantly higher when compared to Child-Pugh C group. The mean HDL-cholesterol value of Child-Pugh A group was higher than those of Child-Pugh B and C groups. Results of this evaluation are shown in figures 1 and 2.

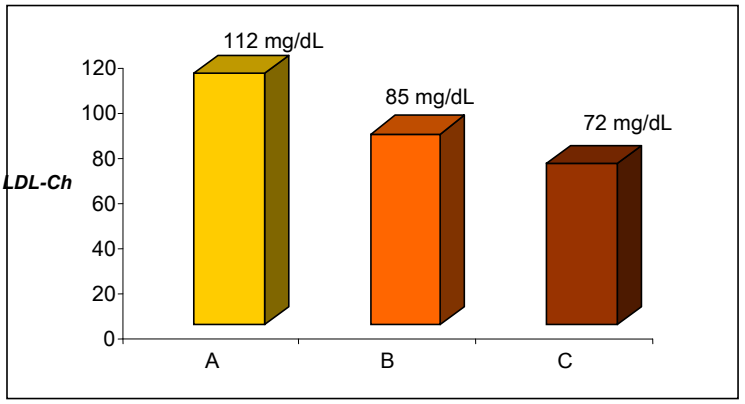

Fig. 1. Mean LDL-cholesterol value of Child-Pugh A was significantly higher compared to Child--Pugh C group (A, B, C – Child-Pugh classification)

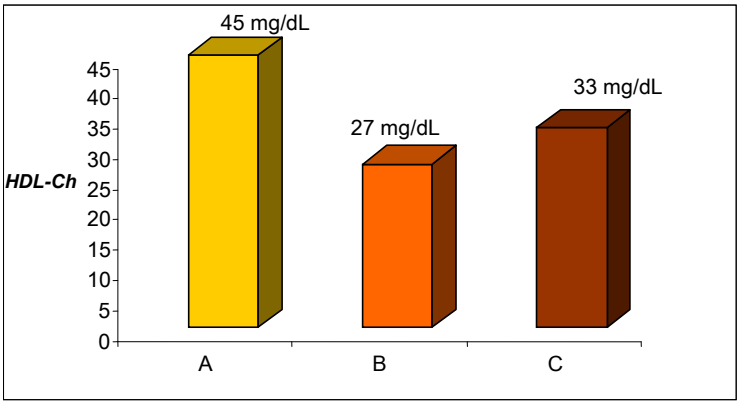

Fig. 2. Mean HDL-cholesterol value of Child-Pugh A group was higher than those of Child-Pugh B and C groups (A, B, C – Child-Pugh classification)

DISCUSSION

Dyslipidemia is a frequent finding in chronic liver disease. Lipids are an essential component of biological membranes, free molecules and metabolic regulators that control cellular function and homeostasis. Liver plays a vital role in lipid metabolism. It contributes both in exogenous and endogenous cycles of lipid metabolism and transport of lipids through plasma. Synthesis of many apolipoproteins takes place in liver. Free fatty acids are esterified in liver and secreted as LDL. Abnormal hepatic functions cause impairment of plasma free fatty acids and triglyceride [6]. Free fatty acid concentration was found to be high in cirrhotic patients and while healthy people use carbohydrate as fuel in satiety, cirrhotic patients use lipids [5].

The clinical outcome of patients with cirrhosis is dictated by the development of complications of portal hypertension and hepatic dysfunction. This is well estimated. Brier C. et al. studied lipoproteins, HDL-apolipoproteins and activities of hepatic lipase and lecithin cholesterol acyl transference in the plasma of patients with post alcoholic liver cirrhosis. Their results showed that in alcoholic cirrhosis, total cholesterol, HDL, VLDL, LDL-cholesterol were all decreased. Intermediate density lipoproteins were not detectable in cirrhosis. LDL from cirrhotic patients contained more triglycerides and less esterified and free cholesterol [1]. In our study we detected that the total cholesterol and LDL-cholesterol concentration was the lowest in the Child-Pugh C group representing the synthetic capacity of the liver. The serum LDL-cholesterol level was inversely related to the severity of the liver disease and the gravity of the prognosis (Child-Pugh classification). The LDL may depend on impaired apoprotein B-100 hepatic synthesis or on defective clearance of VLDL remnant particles [2]. When cirrhotic patients were re-evaluated according to Child-Pugh classification, HDL level was found to be the highest in Child-Pugh A and the lowest in Child-Pugh B group. The progressive decrease in the serum HDL-cholesterol level in the patients with cirrhosis may reflect reduced hepatic apoprotein A-1 [4] synthesis and lecithin-cholesterol acyltransferase

deficit [3]. Consequently, we detected that in cirrhosis lipid parameters are affected. Mostly, the mean values were found to be gradually decreased in cirrhotic group, from Child-Pugh A do Child-Pugh C, representing the degrading hepatic functions.

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SUMMARY

The most common causes of liver cirrhosis are chronic alcoholism and hepatitis C. Child-Pugh (Ch-P) score is a classification of the severity of cirrhosis. In the course of cirrhosis plenty of metabolic disorders appear. The aim of the research was to analyze lipid disorders in patients with alcoholic liver cirrhosis depending on the severity of hepatic cell damage according to the Child-Pugh classification. 152 patients with alcoholic liver cirrhosis, who were hospitalized in the internal medicine ward, were qualified for the research. The patients were divided into 3 groups according to the Child–Pugh classification. In the analyzed group, there were 22 persons in class A, 56 in class B and 74 in class C. The levels of the lipids were measured in all patients. HDL-cholesterol concentration in patients with cirrhosis in class A according to the Ch-P score was statistically higher than in the subjects in class B or C. LDL-cholesterol level was significantly higher in patients from group A Ch-P classification than from group C. There was no statistically significant difference in total cholesterol and triglycerides level between patients from groups A, B and C of the Ch-P score. The hepatic cell damage leads to the diminution of the HDL and LDL-cholesterol levels in patients with alcoholic liver cirrhosis. There was no statistically significant difference between all groups of subjects classified according to the Ch-P classification in serum total cholesterol and triglycerides levels.

Key words: alcoholic liver cirrhosis, lipids disorders

STRESZCZENIE

Do najważniejszych przyczyn marskości wątroby należą przewlekły alkoholizm i wirusowe zapalenie wątroby. Do oceny nasilenia zmian marskich w wątrobie służy klasyfikacja wg Childa-Pugha (Ch-P). W przebiegu marskości wątroby dochodzi do pojawienia się licznych zaburzeń metabolicznych. Celem pracy była analiza zaburzeń lipidowych u pacjentów z alkoholową marskością wątroby w zależności od stopnia zaawansowania wg klasyfikacji Childa-Pugha (Ch-P). Do badania zakwalifikowano 152 pacjentów z poalkoholową chorobą wątroby. Pacjentów podzielono na trzy podgrupy wg klasyfikacji Child-Pugha. Pacjentów z marskością wątroby w stadium A było 22, w stadium B – 56, natomiast w stadium C – 74. U wszystkich pacjentów oznaczono stężenie lipidów w surowicy krwi. Stężenie HDL-cholesterolu u pacjentów z marskością wątroby wg Ch-P w podgrupie A było statystycznie wyższe w stosunku do pacjentów w podgrupach B i C. Natomiast stężenie LDL-cholesterolu było statystycznie wyższe u pacjentów z podgrupy A wg Ch-P w porównaniu do podgrupy C. Nie stwierdzono istotnych statystycznie różnic w stężeniu cholesterolu całkowitego i triglicerydów między podgrupami A, B i C wg klasyfikacji Ch-P. Nasilenie zmian marskich wątroby prowadzi do zmniejszenia stężenia HDL i LDL-cholesterolu u pacjentów z alkoholową chorobą wątroby. Natomiast nie stwierdzono istotnych statystycznie różnic pomiędzy podgrupami pacjentów z marskością wątroby pod względem stężenia cholesterolu całkowitego i triglicerydów.

Słowa kluczowe: alkoholowa marskość wątroby, zaburzenia lipidowe